

FIG. 2

OPCODE	COMMAND MEANING
00 0000 0000	NO INFORMATION
00 0000 0001	RESERVED
00 0000 0010	PC TRACE GAP
00 0000 0011	REPEAT INSTRUCTION
00 0000 0100	COUNTER START
00 0000 0101	COUNTER OVERFLOW/COUNTER VALUE
00 0000 0110	RESERVED
00 0000 0111	COMMAND ESCAPE
00 0000 1xxx	EXCEPTION OCCURRED
00 0001 0xxx	TIMING SYNC POINT
00 0001 1xxx	MEMORY REFERENCE SYNC POINT
00 0010 xxxx	PC SYNC POINT/FIRST/LAST/TRIGGER
00 010x xxxx	SAME PC
00 011x xxxx	CPU AND ASIC DATA
00 10xx xxxx	RESERVED
00 11xx xxxx	MEMORY REFERENCE BLOCK
01 xxxx xxxx	BRANCH/BEGINNING OF PARAMETER
10 xxxx xxxx	CONTINUE
11 xxxx xxxx	TIMING

FIG. 3

TIMING PACKET EXAMPLES

OPCODE	CYCLE BITS	MEANING
11	00000000	8 CONSECUTIVE CYCLES OF EXECUTION
11	11111111	8 CONSECUTIVE STALL CYCLES
11	11110000	THE RIGHT MOST BITS INDICATE THE PROCESSOR EXECUTED FOR 4 CYCLES AND THEN STALLED 4 CYCLES
11	10101010	THE BITS MEAN EXECUTE, STALL, EXECUTE, STALL, EXECUTE, STALL, EXECUTE, AND STALL RESPECTIVELY

$FIG. \overline{4}$

TIMING SYNC PACKET

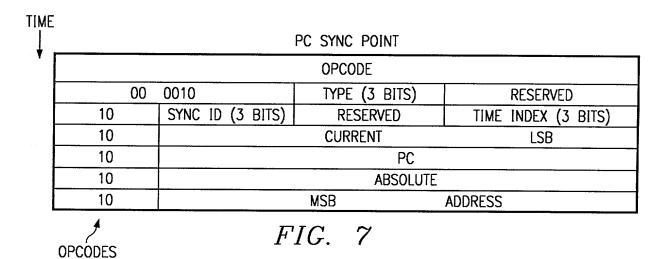
TIMING SYNC HEADER	3-BIT	PC.	SYNC	ID
TIMINO STRO FILADER	יוט כן		31140	10

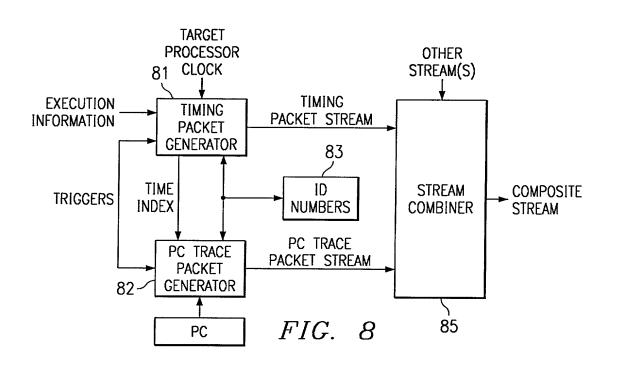
FIG. 5

3/10
PC SYNC POINT TYPES

TYPE	SYNC TYPE	REASON FOR SYNC POINT
000	TRIGGER	USER DEFINED TRIGGER
001	FIRST POINT	STANDBY MODE
010	SYNC POINT	PERIODICALLY GENERATED
011	FIRST POINT	STREAM ENABLED
100	LAST POINT	STREAM DISABLED

FIG. 6



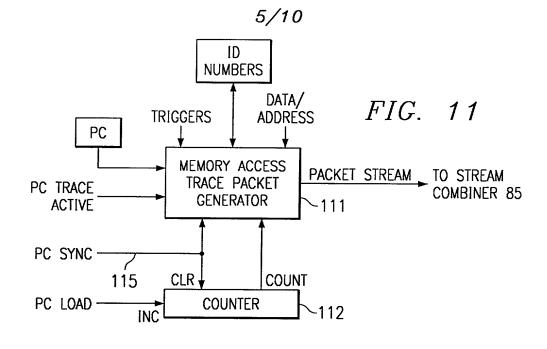


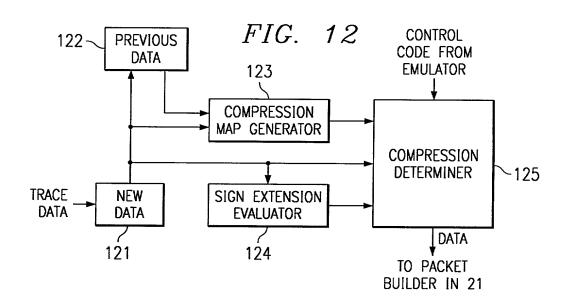
	PACKET	SEQU	ENCE		
			D/ST DATA, ADDRESS, PC BIT) (5 BITS)		
01	DATA	BYTE	0 LSB		
10	DAT	A BY	TE 1		
10	DAT	A BY	TE 2		
10	DATA	A BY	TE 3		
10	DATA	A BY	TE 4		
10	DATA	A BY	TE 5		
10	DATA	A BY	TE 6		
10	MSB D	ATA	BYTE 7		
01	DATA ADDRI	BYTE 0 LSB			
10	DATA ADI	DRES	DRESS BYTE 1		
10	DATA ADI	S BYTE 2			
10	MSB DATA A	ADDR	ESS BYTE 3		
01	NATIVE PC ADDRESS BYTE 0 LSB		OFFSET, BITS 7–0 (8 BITS)		
10	NATIVE PC ADDRESS BYTE 1		OFFSET, BITS 15-8 (8 BITS) (OPTIONAL)		
10	NATIVE PC ADDRESS BYTE 2	OR	NOT NEEDED		
10	MSB NATIVE PC ADDRESS BYTE 3		NOT NEEDED		

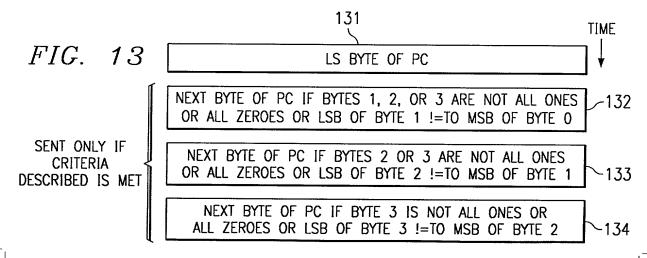
MEMORY REFERENCE SYNC POINT

OPCODE	PARAMETER FIELD (3-BITS)
00 00011	MSB SYNC ID LSB

FIG. 10







COMPRESSION EXAMPLE 0					
PREVIOUS DATA 1111111111111111111111111111111111					
NEW DATA 1111111111111111111111111111111111					
COMPRESSION BIT MAP SENT	NONE BECAUSE ONLY ONE BYTE COMPRESSES				
SEND BYTES	DROPPED DROPPED DROPPED SENT				
BYTE #0 IS SENT					

FIG. 14

COMPRESSION EXAMPLE 1					
PREVIOUS DATA #11111111111111111111111111111111111					
NEW DATA #11111111111111111111111111111111111					
COMPRESSION BIT MAP SENT NO BECAUSE ONLY ONE BYTE COMPRESSES					
SEND BYTES	DROPPED DROPPED SENT				
BYTE #0 IS SENT					

FIG. 15

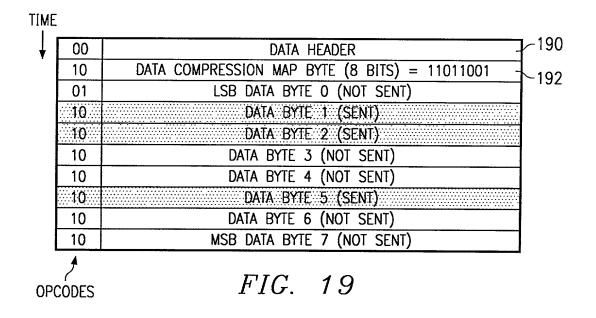
COMPRESSION EXAMPLE 2						
PREVIOUS DATA #11101111 11101111 110000011						
NEW DATA #11/01/11 11/01/11 10000100						
COMPRESSION BIT MAP SENT	YES BECAUSE NO SIGN EXTENSION AND TWO OR MORE BYTES COMPRESS					
SEND BYTES	DROPPED DROPPED SENT					
BYTE #0 IS SENT						

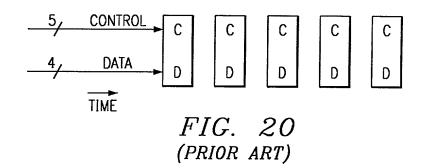
FIG. 16

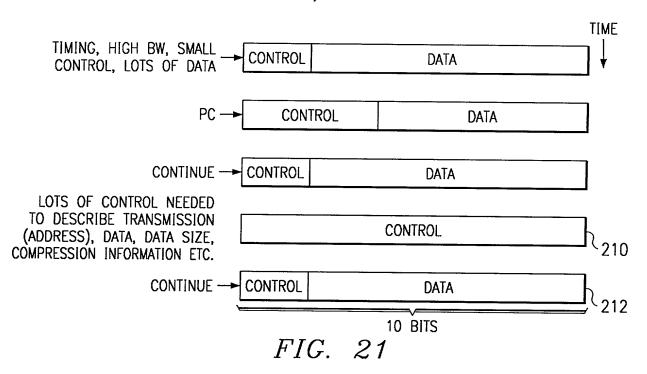
COMPRESSION EXAMPLE 3						
PREVIOUS DATA						
NEW DATA 111111111111111111000011110000100						
COMPRESSION BIT MAP SENT	YES BECAUSE NO SIGN EXTENSION AND TWO OR MORE BYTES COMPRESS					
SEND BYTES DROPPED DROPPED DROPPED DROP						
NO BYTES ARE SENT						

COMPRESSION EXAMPLE 4						
PREVIOUS DATA #10000014# 00000100 #1114141# 11111111						
NEW DATA						
COMPRESSION BIT MAP SENT YES BECAUSE TWO OR MORE BYTE COVERED BY SIGN EXTENSION COM						
SEND BYTES	DROPPED DROPPED DROPPED					
NO BYTES ARE SENT						

FIG. 18







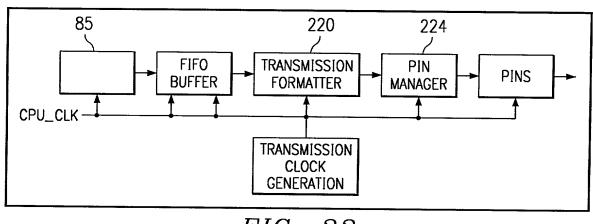
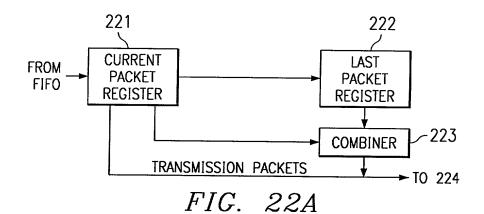


FIG. 22



6 TRACE PACKETS TRANSMITTED AS 10 TRANSMISSION PACKETS										
10	10 10 10			10	10 10				10	
6	6	6	6	6	6	6	6	6	6	
	TIME									

FIG. 23

10	10	10	10	10	10		
12	12	•	12	12	12		

FIG. 23A

10	10	10	10	10	10	10	10		
16		16	1	6	16		16		

FIG. 23B

REGISTER 221																ISTI 222	ER				
# CURRENT TRANSMISSION PACKET										# INCOMPLETE TRANSMISSION PACKET											
0	9	8	7	6	5	4	3	2	1	0	EMPTY										
1	9	8	7	6	5	4	3	2	1:	0	0	9	8	7	6	5	4	3	2	1	0
1	9	8	.7	6	5	4	3	2	1	0	1	9	8	7	6	5	4	3	2	1	0
2	9	8	7	6	5	4	:3:	2	1	0	1	9	8	7	6	5	4	3	2	1	0
2	9	8	7	6	5	4	3	2	1	0	2	9	8	7	6	5	4	3	2	1	0
3	9	8	7	6	5	4	3	2	, 1	0.	2	9	8	7	6	5	4	3	2	1	0

FIG. 24

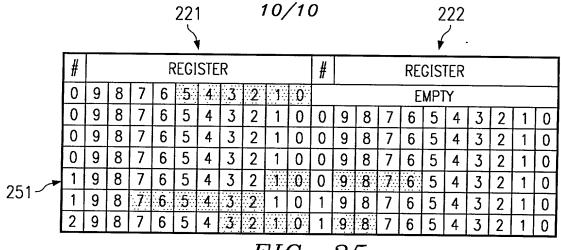
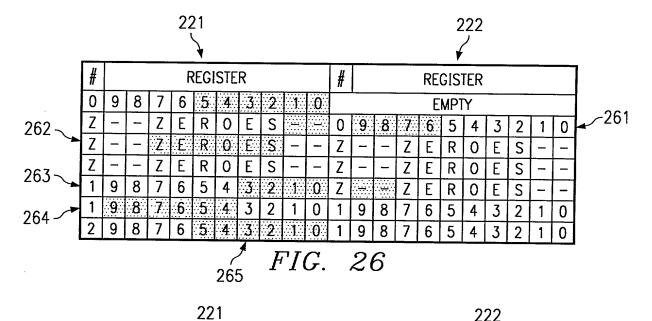


FIG. 25



222

		•												✓											
	#		REGISTER										# REGISTER												
	0	9	9 8 7 6 5 4 3 2 1 0										EMPTY												
	Z	_	_	Z	Ε	R	0	E	S			0	9	8	7	6	5	4	3	2	1	0			
	Z	_	<u> </u>	Z	Ε	R	0	Ε	S	_	_	Z	_	-	Z	Ε	R	0	E	S	-	-			
	Z	_	_	Z	Ε	R	0	E	S	::-		Z	-		Z	Ε	R	0	Ε	S	-	-			
	Z	-		Z	E	R	0	E	S	_	_	Z	_	_	Z	Ε	R	0	Ε	S	-	-			
	Z	_	_	Z	Ε	R	0	Ε	S	.::		Z	_	_	Z	Ε	R	0	Ε	S	_	-			
	Ζ	_	_	Z	Ε	R	0	E	S	-	:::::	Z		: <u>:-</u> ::	Z	Ε	R	0	E	S	_	-			
271~.	Z	_	_	Z	Ε	R	0	Ε	S	_	-	Z	_	_	Z	Ε	R	0	Ε	S	_	-			
2/1	1	9	8	7	6	5	4	3	2	1	0	Z	-	::-::	Ζ	Ε	R	0	Ε	S	_	-			
	1	9		7	6	5	4	3	2	1	0	1	9	8	7	6	5	4	3	2	1	0			
	2	9	8	7	6	5	4	3	2	1	0	2	9	8	7	6	5	4	3	2	1	0			

FIG. 27